PAIDC

| QUERY CONTROL FORM | | | RTIS USE ONLY | |
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| Application No. | 10/661,660 | Prepared by | NH | Tracking Number 05909664 |
| Examiner-GAU | Donovan - 2832 | Date | 3-17-4 | Week Date 02/23/04 |
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| JACKET | | | |
|---|---|---|---|
| a. Serial No. | f. Foreign Priority | k. Print Claim(s) | p. PTO-1449 |
| b. Applicant(s) | g. Disclaimer | l. Print Fig. | q. PTOL-85b |
| c. Continuing Data | h. Microfiche Appendix | m. Searched Column | r. Abstract |
| d. PCT | i. Title | n. PTO-270/328 | s. Sheets/Figs |
| e. Domestic Priority | j. Claims Allowed | o. PTO-892 | t. Other |

**SPECIFICATION**

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b. Text Continuity
c. Holes through Data
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f. Duplicate Text
g. Brief Description
h. Sequence Listing
i. Appendix
j. Amendments
k. Other

**CLAIMS**

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d. Incorrect Numbering
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f. Punctuation
g. Amendments
h. Bracketing
i. Missing Text
j. Duplicate Text
k. Other

**MESSAGE**

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Thankyou

initials NH

**RESPONSE**

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2/30/04

E-5 (Rev. 10/01/02)

10/661,660



miniaturized and integrated more easily than the conventional relay utilizing the electromagnetic force and, thus, is expected to be utilized in the field of vehicles.

As an example of the microswitch utilizing the particular MEMS technology, a microswitch manufactured by utilizing the Ni plating is disclosed in "Paul M, Zavracky et al., Micromechanical Switches Fabricated Using Niker Surface Micromachining", which is reported in "Journal of Microelectro Mechanical Systems, (USA), (IEEE/IEE), 1997, Vol. 6, p. 3, FIG. 2".

The method of manufacturing the microswitch is schematically illustrated in FIG. 2 of the publication noted above, and the fabrication procedure is described in this publication with reference to FIG. 2. In the fabrication procedure disclosed in this publication, a silicon oxide film is formed first on a Si substrate, followed by forming on the silicon oxide film a Cr film and a Au film forming a first contact layer. Then, a source electrode, a gate electrode and a drain electrode are formed by the patterning using the photolithography. After formation of these electrodes, a Cu film acting as a sacrificial layer is formed, followed by etching the Cu layer so as to form a hemispherical concave portion and a hole extending to reach the source electrode. Then, a resist layer is patterned so as to form a Au film acting as a second

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on the polycrystalline diamond thin film 11 substantially in symmetry with respect to the first contact layer 49.

The first contact layer 49 and the gate electrodes 48a, 48b can be formed by patterning a polycrystalline diamond thin film doped with boron (B). A large number of fine holes are formed in the first contact layer 49 by a method similar to that employed in the first embodiment of the present invention described previously, and a Ni electrode 47a are buried in the large number of the fine holes. The Ni electrode 47a is constructed to form an array of a large number of slender columnar Ni layers. It is possible for the upper surface of the contact layer 49 to be flush with the upper surface of the Ni electrode 47a. Alternatively, it is also possible to etch slightly the Ni electrode so as to allow the upper surface of the Ni electrode 47a to be somewhat lower than the upper surface of the contact layer 49. In this case, it is possible for a large number of recesses to be formed on the upper surface of the contact layer 49 such that the upper surface of the Ni electrode 47a is exposed to the outside within these recesses.

Also, a beam 43 is formed to extend over the first contact layer 49 and the gate electrodes 48a, 48b. Also, supporting legs 43a, 43b on both sides of the beam 43 are fixed to the undoped polycrystalline